UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,580	01/31/2006	Mitsuru Yamamoto	Q92973	5128

23373 7590 01/30/2009

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
STIMPERT, PHILIP EARL	
ART UNIT	PAPER NUMBER
3746	

MAIL DATE	DELIVERY MODE
01/30/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/566,580	YAMAMOTO ET AL.	
	Examiner	Art Unit	
	Philip Stimpert	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10,11,17,18,21 and 22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10,11,17,18,21 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

1. The indicated allowability of claims 10, 11, 17, 18, 21, and 22 is withdrawn in view of the newly discovered reference(s) to Komatsu et al. (US 2003/0017063). Rejections based on the newly cited reference(s) follow.

2. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 11 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Each of claims 11 and 18 recites in its second line "the check valve." There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 10, 11, 17, 18, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grosjean et al. (US 6,520,753) in view of Komatsu et al.

8. Regarding claim 10, Grosjean et al. teach a diaphragm pump comprising a pressure chamber (21, 22, 23) formed into a flat shape (as shown in Figs. 1-2 particularly) and filled with liquid (col. 2, ln. 23-25), a suction side flow passage (24) at a left end of the pressure chamber (21, 22, 23) and a discharge side flow passage (26) at the right end of the pressure chamber (21, 22, 23). The axes of the flow passages may be considered to be aligned in several senses. The vertical sections of these passages are substantially parallel, which constitutes a form of alignment. Furthermore, there are also coaxial sections of these passages interfacing directly with the pressure chamber ends (21, 23). Grosjean et al. also teach a groove (namely the pressure chamber itself) formed in the peripheral wall of the pressure chamber (21, 22, 23) for accelerating a flow of the liquid downstream (as part of the pumping action of the diaphragm pump generally). Finally, Grosjean et al. teach a diaphragm (14) comprising a lower surface of the pressure chamber (21, 22, 23) and oscillating to vary the volume of the pressure chamber (col. 2, ln. 57-61). Grosjean et al. do not teach an intake opened to an upper surface of the suction side flow passage to introduce bubbles mixed in the liquid into a sealed space. Komatsu et al. teach a miniature diaphragm pump for a cooling system. In particular, Komatsu et al. teach an intake (see Fig. 4, at 42) opening to an upper surface of a suction side flow passage (at 10) and a sealed space (42, sealed from the pumping chamber 50 by the inlet valve 33a). Komatsu et al. teach that this structure is useful for preventing air bubbles from entering the pumping chamber (paragraph 62), which prevention one of ordinary skill would expect to have a beneficial effect on pumping efficiency (abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the pump of Grosjean et al. with

an intake and sealed space as taught by Komatsu et al. in order to prevent the travel of air bubbles into the pumping chamber of Grosjean et al.

9. Regarding claim 11, Komatsu et al., teach that the intake is positioned in the suction side flow passage upstream of a check valve (33a). It would have been obvious to one of ordinary skill in the art at the time of the invention to maintain this arrangement in a combination with Grosjean et al., given that one of ordinary skill would find it obvious to use to the valves of Komatsu et al. in the pump of Grosjean et al. for the well-known purpose of ensuring unidirectional flow through the pump.

10. Regarding claim 17, Grosjean et al. teach a diaphragm pump comprising a pressure chamber (21, 22, 23) formed into a flat shape (as shown in Figs. 1-2 particularly) and filled with liquid (col. 2, ln. 23-25), a suction side flow passage (24) at a left end of the pressure chamber (21, 22, 23) and a discharge side flow passage (26) at the right end of the pressure chamber (21, 22, 23). The axes of the flow passages may be considered to be aligned in several senses. The vertical sections of these passages are substantially parallel, which constitutes a form of alignment. Furthermore, there are also coaxial sections of these passages interfacing directly with the pressure chamber ends (21, 23). Grosjean et al. also teach a groove (namely the pressure chamber itself) formed in the peripheral wall of the pressure chamber (21, 22, 23) for accelerating a flow of the liquid downstream (as part of the pumping action of the diaphragm pump generally). Further, Grosjean et al. teach a diaphragm (14) comprising a lower surface of the pressure chamber (21, 22, 23) and oscillating to vary the volume of the pressure chamber (col. 2, ln. 57-61). Finally, as shown in Figs. 1, 2, and 8, Grosjean et al. teach that each cross-sectional shape of the pressure chamber (21, 22, 23), the suction side flow passage (24), and the

discharge side flow passage (26) in surfaces orthogonal to the axes are formed in an approximate rectangle, and that the lower surface (14) of the pressure chamber (21, 22, 23) is the same surface as the lower surfaces of the suction and discharge side flow passages. Grosjean et al. do not teach an intake opened to an upper surface of the suction side flow passage to introduce bubbles mixed in the liquid into a sealed space. Komatsu et al. teach a miniature diaphragm pump for a cooling system. In particular, Komatsu et al. teach an intake (see Fig. 4, at 42) opening to an upper surface of a suction side flow passage (at 10) and a sealed space (42, sealed from the pumping chamber 50 by the inlet valve 33a). Komatsu et al. teach that this structure is useful for preventing air bubbles from entering the pumping chamber (paragraph 62), which prevention one of ordinary skill would expect to have a beneficial effect on pumping efficiency (abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the pump of Grosjean et al. with an intake and sealed space as taught by Komatsu et al. in order to prevent the travel of air bubbles into the pumping chamber of Grosjean et al.

11. Regarding claim 18, Komatsu et al., teach that the intake is positioned in the suction side flow passage upstream of a check valve (33a). It would have been obvious to one of ordinary skill in the art at the time of the invention to maintain this arrangement in a combination with Grosjean et al., given that one of ordinary skill would find it obvious to use to the valves of Komatsu et al. in the pump of Grosjean et al. for the well-known purpose of ensuring unidirectional flow through the pump.

12. Regarding claim 21, Komatsu et al. teach the use of piezoelectric elements (30) to drive piezoelectric oscillators and to thereby create a pumping action. It would be obvious to

substitute the piezoelectric actuation of Komatsu et al. for the thermopneumatic actuation of Grosjean et al. as a matter of ordinary skill in the art.

13. Regarding claim 22, Komatsu et al. teach a cooling system (Fig. 3) using a diaphragm pump (100) and a closed-structure flow passage (60) for circulating liquid from the discharge side flow passage, through head exchanging units, and back to the suction side flow passage. This would indicate to one of ordinary skill in the art that the pump of Grosjean et al. could be used in a heat-exchange apparatus as taught by Komatsu et al. which would include a closed structure flow passage. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a pump as taught by Grosjean et al. in a closed-structure flow passage as taught by Komatsu et al. in order to provide a heat-exchange system for the applications envisioned by Komatsu et al.

Response to Arguments

14. Applicant's arguments with respect to claims 10, 11, 17, 18, 21, and 22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip Stimpert whose telephone number is (571)270-1890. The examiner can normally be reached on Mon-Fri 7:30AM-4:00PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746

/P. S./
Examiner, Art Unit 3746
23 January 2009